

**WHAT IS CLAIMED IS:**

1. An isolated nucleic acid comprising a nucleotide sequence encoding a polypeptide having the amino acid sequence of Figure 2 (SEQ ID NO: 2).
2. The isolated nucleic acid of claim 1, comprising the nucleotide sequence of Figure 1 (SEQ ID NO: 1).
3. A recombinant vector comprising a nucleotide sequence encoding a polypeptide having the amino acid sequence of Figure 2 (SEQ ID NO:2).
4. A host cell comprising the recombinant vector of claim 3.
5. A host cell genetically engineered to comprise the nucleic acid of claim 1.
6. The host cell of claim 5 which is eukaryotic.
7. A eukaryotic host cell genetically engineered to express, or overexpress, a polypeptide having the amino acid sequence of Figure 2 (SEQ ID NO: 2).
8. A method for expressing a polypeptide in a cell cultured *in vitro* comprising culturing the cell of claim 4, 5, 6 or 7 under conditions conducive to the expression of the polypeptide comprising the amino acid sequence of Figure 2 (SEQ ID NO:2).
9. An isolated polypeptide comprising the amino acid sequence of Figure 2 (SEQ ID NO:2).

10. A host cell genetically engineered to co-express a polypeptide comprising the amino acid sequence of Figure 2 (SEQ ID NO:2) and a  $\beta$ -subunit of a sodium channel selected from the group consisting of  $\beta$ 1,  $\beta$ 2, and  $\beta$ 3.

11. An antibody or antigen-binding fragment that specifically binds to a polypeptide having the amino acid sequence of Figure 2 (SEQ ID NO: 2).

12. The antibody of claim 11, which is a monoclonal antibody.

13. A method for detecting expression in a sample of a polypeptide comprising the amino acid sequence of Figure 2 (SEQ ID NO:2), which method comprises detecting specific binding of the antibody or antigen-binding fragment of claim 11 to a polypeptide in the sample.

14. A method for identifying a test compound that binds to a sodium channel comprising a polypeptide comprising the amino acid sequence of Figure 2 (SEQ ID NO:2), which method comprises:

(i) contacting a host cell that expresses a sodium channel comprising a polypeptide comprising the amino acid sequence of Figure 2 (SEQ ID NO:2) with a test compound; and

(ii) determining whether the test compound binds to the host cell but not to a control cell that does not express a sodium channel comprising a polypeptide comprising the amino acid sequence of Figure 2 (SEQ ID NO:2).

15. An assay method for identifying a test compound that modulates the activity of a sodium channel comprising a polypeptide comprising the amino acid sequence of Figure 2 (SEQ ID NO:2), which method comprises:

(i) providing a host cell that expresses a functional sodium channel comprising at least one polypeptide comprising the amino acid sequence of Figure 2 (SEQ ID NO:2),

(ii) contacting the host cell with a test compound under conditions that would activate sodium channel activity of said functional sodium channel in the absence of

the test compound; and

(iii) determining whether the host cell contacted with the test compound exhibits a modulation in activity of the functional sodium channel.

16. The assay method of claim 15, wherein the host cell has been genetically engineered to express or overexpress the functional sodium channel.

17. The assay method of claim 15, wherein the host cell has been genetically engineered by the introduction into the cell of a nucleic acid molecule having a nucleotide sequence encoding a polypeptide comprising the amino acid sequence of Figure 2 (SEQ ID NO:2).

18. The assay method of claim 15, wherein the host cell has been genetically engineered to upregulate the expression of a nucleic acid encoding a polypeptide comprising the amino acid sequence of Figure 2 (SEQ ID NO:2),

19. The assay method of claim 18, wherein the upregulated nucleic acid is endogenous to the host cell.

20. The assay method of claim 15, wherein the modulation of the functional sodium channel activity is antagonism of that activity.

21. The assay method of claim 15, wherein the modulation of the functional sodium channel activity is agonism of that activity.